

**CLAIMS**

1. An electric power steering system operative to decide a target current value of an electric motor according to an operation of a steering member and to  
5 provide steering assist by applying a power of the motor to a steering mechanism, comprising:

torque-ripple compensation decision means which uses rotational position information on the electric motor and the decided target current value to thereby  
10 decide a compensation value for current high-order-component for canceling torque ripple caused by predetermined high-order components of the current flowing through the motor;

correction means for correcting the decided target  
15 current value by using the compensation value supplied from the torque-ripple compensation decision means; and

feedback control means for providing feedback control of the electric motor based on the target current value corrected by the correction means.

20 2. An electric power steering system according to Claim 1, wherein the torque-ripple compensation decision means varies the compensation value for current high-order-component according to the decided target current value.

25 3. An electric power steering system according to

Claim 1 or 2, wherein the torque-ripple compensation decision means is provided not only with a high-order current distortion compensator for deciding the compensation value for current high-order-component,  
5 but also with

a magnetic-field distortion compensator which uses the rotational position information on the electric motor and the decided target current value, for deciding a field-distortion compensation value for suppressing  
10 torque ripple caused by a distorted magnetic field formed in the motor.

4. An electric power steering system according to any one of Claims 1 to 3, further comprising:

a current control system including the electric  
15 motor and the feedback control means;

rotational-speed detection means for detecting a rotational speed of the electric motor based on the rotational position information; and

gain compensation calculation means for  
20 determining a gain compensation value for compensating for gain decrease dependant upon a frequency characteristic of the current control system, the compensation value determined based on the rotational speed of the electric motor supplied from the  
25 rotational-speed detection means,

wherein the correction means corrects the decided target current value by using the compensation value supplied from the torque-ripple compensation decision means and the gain compensation value supplied from the gain compensation calculation means.

5. An electric power steering system according to Claim 4, further comprising phase compensation calculation means for determining a phase compensation value for compensating for phase delay dependant upon the frequency characteristic of the current control system, the phase compensation value determined based on the rotational speed of the electric motor supplied from the rotational-speed detection means,

wherein the correction means corrects the decided target current value by using the compensation value supplied from the torque-ripple compensation decision means, the gain compensation value supplied from the gain compensation calculation means and the phase compensation value supplied from the phase compensation calculation means.